**Portable Radio Requirements Matrix**

The Los Angeles Regional Interoperable Communications System (LA-RICS) Authority (Authority) seeks to generate a list of handheld portable and mobile two-way radios and associated accessories that are compatible with the LA-RICS Land Mobile Radio (LMR) System via this Request for Information (RFI). The resultant list may be used by any Member Agency to compare and procure Portable Radios that are compatible and operate on the LMR System. Pursuant to the RFI, the Authority will test any equipment and/or software submitted for compliance with any-and-all specifications included in this Exhibit A (Portable Radio Requirements Matrix) and Exhibit B (Portable Radio Testing Criteria).

**This Exhibit A (Portable Radio Requirements Matrix) shall be completed and provided for EACH proposed Portable Radio (Radio) model.** Please refer to Section 3.4 (Exhibit A – Portable Radio Requirements Matrix) of the RFI, which states in relevant part:

**"Where the Respondent believes that the requirement or question does not apply to a particular Radio offered by the Respondent, "Not/Applicable" should be placed in the "Response" field. Two (2) columns are provided for Respondent feedback and other information.**

**The "Comply" column has two purposes. First, the Authority identified certain requirements as "Mandatory" in red text to indicate that the line item is a mandatory minimum requirement for a Radio for use on the LMR System. If "Mandatory" is NOT indicated in a particular line item, that functionality and/or feature is NOT Mandatory. In addition, for all the questions, Respondents shall provide a "yes" or "no" response in that "Comply" column regarding the question posed for that row in the matrix.**

**The "Response" column shall expand the "yes" or "no" response in the "Comply" column providing clear yet concise background information. Additional specific instructions are provided in the Exhibit that will aid Respondents in describing how their Radios meet the requirements."**

For each Radio Type, choose among the following types (More than one option may apply to a single Radio):

| **RADIO INFORMATION** | **DESCRIPTION** |
| --- | --- |
| Radio Name: |       |
| Radio Manufacturer: |       |
| Radio Model Number: |       |
| Radio Type: |       |
| Radio Class {1,3}: |       |
| Radio Frequency/Bands Supported: |       |
| Radio Firmware/Software Version: |       |
| Radio Processor Type and Speed: |       |
| Radio Storage Capacity (include volatile and non-volatile storage and memory): |       |
| Radio Dimensions (in inches): |       |
| Radio Weight (in ounces): |       |
| Cost of Radio(Including all functionality/features the Radio complies with pursuant to this Compliance Matrix which was completed by the Respondent) |       |

| **PORTABLE RADIO REQUIREMENTS MATRIX** |
| --- |
| **ITEM** | **DESCRIPTION** | **MANDATORY****(If Indicated)** | **COMPLY****“YES” OR “NO”** | **RESPONSE** |
| 1. **GENERAL REQUIREMENTS**
 |
| A.1 | Respondent acknowledges the LA-RICS LMR System is an APCO Project 25 (P25) Phase 1 and Phase 2 compliant system that uses a Motorola Astro P25 Multi Zone Simulcast System 7.18. In addition, LA-RICS LMR System uses an Analog Voice Simulcast Radio System LMR for mutual aid and analog communications.  |  |       |       |
| A.2 | **Respondent who wishes to submit radios pursuant to this RFI has not been:**1. **Debarred within the last five (5) years by any public agency in the United States;**
2. **Barred at any time, for reasons of national security, by any agency of the federal government, from bidding on a contract, participating in an auction for frequencies, or receiving a grant; or**
3. **Identified at any time, as a security threat, or potential security threat, to the United States, by any agency in the federal government or any**

**committee or subcommittee of Congress.** | Mandatory |       |       |
| A.3 | **All equipment being tested must be fully compatible and capable of operating on LMR System infrastructure as identified in this RFI.** | Mandatory |       |       |
| A.4 | **Respondents must provide, at no cost to the Authority, two (2) fully functional and compliant sample Radios including all required cables, accessories, and software necessary to allow programming and testing,** **with your RFI response**. Note that equipment used for testing may be damaged in the process. The Authority will not be liable or responsible for reimbursement of any costs for damaged equipment. Sample Radios and accessories shall be submitted with its RFI Response to Melissa Saradpon pursuant to Section 3.8 (Submission Instructions) of the RFI. | Mandatory |       |       |
| A.5 | Sample Radios may be tested to ensure compliance with any-and-all specifications in this RFI. The Radio may be tested, and must be fully compliant, where applicable, with the following industry standards: | Mandatory |       |       |
| 1. APCO Project 25 (P25) Phase 1
 | Mandatory |       |       |
| 1. APCO Project 25 (P25) Phase 2
 | Mandatory |       |       |
| 1. U.S. Military MIL-STD-810G
 |  |       |       |
| 1. IEC Standard 60529 IP68 Rating
 |  |       |       |
| 1. TIA/EIA 603
 | Mandatory |       |       |
| 1. TIA/EIA-102
 | Mandatory |       |       |
| 1. FCC CFR Title 47 Part 80
 |  |       |       |
| 1. FCC CFR Title 47 Part 90
 | Mandatory |       |       |
| 1. FIPS PUB 197 AES Standard
 |  |       |       |
| 1. FIPS PUB 140-3 Level 3 Standard
 |  |       |       |
| 1. U.S. Dep. Of Defense WGS 84
 |  |       |       |
| A.6 | All technical and/or industry standards referenced in this document must refer to the most current version as defined by the relevant governing body of that standard as of the date of this RFI. All standards must be defined by the applicable governing body and should be obtained by the Respondent directly from the governing body’s website or the most current documentation provided by the governing body. | Mandatory |       |       |
| A.7 | Radio must be certified compliant with the Department of Homeland Security (DHS) P25 Compliance Assessment Program (CAP). Respondent must provide the appropriate Declaration of Compliance and a Summary Test Report from a DHS P25 CAP accredited independent testing laboratory with this RFI response and demonstrate the following P25 operations work on the Radio: | Mandatory |       |       |
|  | 1. P25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.1.1).
 | Mandatory |       |       |
|  | 1. P25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance - FDMA (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.1.2).
 | Mandatory |       |       |
|  | 1. P25 Phase 2 Common Air Interface Trunked Subscriber Unit Performance - TDMA (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.1.3).
 | Mandatory |       |       |
|  | 1. P25 Phase 1 Common Air Interface Conventional Subscriber Unit Interoperability (Direct Mode) (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.3.1).
 | Mandatory |       |       |
|  | 1. P25 Phase 1 Common Air Interface Conventional Subscriber Unit Interoperability (Repeat Mode) (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.3.2).
 | Mandatory |       |       |
| A.7(cont’d) | 1. P25 Phase 1 Common Air Interface Conventional Subscriber Unit Interoperability (FNE with DMC – Repeat Mode) (P25**-**CAB-CAI\_TEST\_REQ Section2.1.3.3).
 | Mandatory |       |       |
|  | 1. P25 Phase 1 Common Air Interface Trunked Subscriber Unit Interoperability - FDMA (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.3.4).
 | Mandatory |       |       |
|  | 1. P25 Phase 2 Common Air Interface Trunked Subscriber Unit Interoperability - TDMA (P25**-**CAB-CAI\_TEST\_REQ Section 2.1.3.5).
 | Mandatory  |       |       |
|  | 1. P25 Enhanced Full Radio Vocoder (IMBE and/or AMBE +2 TIA-102.BABG).
 | Mandatory |       |       |
|  | 1. When optioned with P25 Advanced Encryption Standard (AES) 256 Encryption(TIA-102.CACD and CAB section 2.3.10 and FIPS PUB 197 Advanced Encryption Standard).
 | Mandatory, when optioned |       |       |
|  | 1. LARICS System Registration and Site Affiliation (TIA-102.CACD Section 2.3.1 and 2.3.5).
 | Mandatory |       |       |
|  | 1. LARICS Group Call (TIA-102.CACD and CAB Section 2.3.2).
 | Mandatory |       |       |
|  | 1. LARICS iCall/Unit-to-Unit Call/Private Call (TIA-102.CACD and CAB Section 2.3.3).
 | Mandatory |       |       |
|  | 1. LARICS Manual, Automatic and Site Adjacency Roaming (TIA-102.CACD).
 | Mandatory |       |       |
|  | 1. LARICS Emergency Call Cancel and Alarm (TIA-102.CACD, CABC-C and CAB section 2.2.7, 2.3.7, 2.3.8 and 2.2.7).
 | Mandatory |       |       |
|  | 1. LARICS Radio Unit Inhibit, Disable and re-enable (TIA-102.CABC-C section 2.2.20).
 | Mandatory |       |       |
| A.8 | No prototype products will be accepted. All Radios must be commercially available for immediate shipment as configured and specified in this RFI. Future planned or upcoming releases information will be acceptable, but not evaluated. | Mandatory |       |       |
| A.9 | Identify if there is any detailed documentation specifying all changes and/or modifications to standard product catalog equipment for the purposes of complying with any specifications or standards referenced in this RFI. |  |       |       |
| A.10 | Respondents must provide the technical specifications for the Radio and affiliated frequency bands to include: | Mandatory |       |       |
|  | 1. Frequency Bands
 | Mandatory |       |       |
|  | 1. Operating temperature
 | Mandatory |       |       |
|  | 1. Transmit power
 | Mandatory |       |       |
|  | 1. Receiver Sensitivity (12db SINAD TIA/EIA 603)
 | Mandatory |       |       |
|  | 1. Receiver Digital Sensitivity (TIA/EIA-102)
 | Mandatory |       |      |
|  | 1. Selectivity (TIA/EIA 603)
 | Mandatory |       |       |
|  | 1. Digital Adjacent Channel Rejection
 | Mandatory |       |       |
|  | 1. Radio Channels and Zone capacity
 | Mandatory |       |       |
|  | 1. Radio Dimensions and weight
 | Mandatory |       |       |
|  | 1. Frequency stability
 | Mandatory |       |       |
|  | 1. Power Consumption in Transmit and in standby
 | Mandatory |       |       |
|  | 1. Analog Adjacent Channel Rejection
 | Mandatory |       |       |
|  | 1. Spurious Emissions
 | Mandatory |       |       |
|  | 1. Spurious Response
 | Mandatory |       |       |
|  | 1. Intermodulation
 | Mandatory |      |       |
|  | 1. Audio interfaces and levels
 | Mandatory |       |       |
|  | 1. Transmit Modulation Limiting for 12.5KHz
 | Mandatory |       |      |
|  | 1. Modulation Fidelity (TIA/EIA 102A)
 | Mandatory |       |       |
|  | 1. Transmit Rise Time
 | Mandatory |       |       |
|  | 1. Transmit low and high-power Rating
 | Mandatory |       |       |
| A.10 | 1. FM Hum and Noise for 12.5KHz channels
 | Mandatory |       |       |
| (cont’d) | 1. Transmit Radiated Emissions
 | Mandatory |       |       |
|  | 1. Transmit Emissions Designator
 | Mandatory |       |       |
| **B. HARDWARE REQUIREMENTS** |
| B.1 | Radio housing (case) is constructed with a high quality, high impact shock-resistant and long-wearing used by public safety operators.  |  |       |       |
| B.2 | Identify if the Radio is in compliance with MIL-STD-810G standards for operation in extreme and rugged environments. |  |       |       |
| B.3 | Identify if the Radio is in compliance with IEC Standard 60529 IP68 Rating immersion standards or if the Radio is water resistant (i.e. rain and water hose spray resistant). |  |       |       |
| B.4 | Identify if the Radio is a sealed internal housing, allowing it to retain its immersion and/or water-resistant rating when the outer housing is cracked or otherwise compromised. |  |       |       |
| B.5 | Identify if the Radio display has high resistance to scratching and impact.  |  |       |       |
| B.6 | Identify if Radio displays are clearly legible when viewed from multiple angles.  |  |       |       |
| B.7 | Identify if the Radio has a display with multi-color backlighting on its front face.  |  |       |       |
| B.8 | Identify if display panels comply with all terms of Sections C (ERGONOMICS), and F (USER INTERFACE) of this Exhibit A, contained herein. |  |       |       |
| B.9 | Identify if the Radio has an integrated GPS option and/or any external GPS attachments. The GPS antenna definition must show if it is internal or external to the Radio. If Radio has GPS, the Respondent must demonstrate how it transmits GPS location data via P25 conventional and/or digital trunking-enabled communications systems. If the Radio has GPS, the Radio must demonstrate how it operates within regards to Section K (GPS SPECIFICATIONS) of this Exhibit A, contained herein. |  |       |       |
| B.10 | Identify if the Radio has an integrated Bluetooth transceiver option within its internal hardware. If so, the Respondent must provide the Bluetooth transceiver information to include use near-field out-of-band pairing for secure operation and transfer of security keys.  |  |       |       |
| B.11 | If the Radio has an integrated Bluetooth, the Respondent must demonstrate how the Radio automatically and quickly it connects to the Bluetooth accessories, without a requirement for menu navigation, once initial setup is completed. |  |       |       |
| B.12 | Identify if the Radio is equipped with a tri-axis accelerometer option, the Respondent must demonstrate if the sensor can be enabled or disabled through software the Respondent. The demonstration must include integrated support for “Man Down” functionality. “Man Down” must demonstrate if it’s capable of triggering emergency notification and sending user ID and GPS location over the air to the LA-RICS LMR System. |  |       |       |
| B.13 | Identify if the Radio has a remote speaker and/or microphone connector. If so, the Respondent must demonstrate how to secure and latch the assembly so it cannot be removed inadvertently. The Respondent must identify if it is equipped with a secondary fastener to secure the remote speaker-microphone. |  |       |       |
| B.14 | Identify if the Radio has options for a desktop base station, vehicle chargers, and desktop chargers. The Respondent must demonstrate how they are used and how they operate. The Respondent must demonstrate if they seat correctly and effortlessly within an appropriate desktop base station, desktop charger (120VAC) and vehicle charger (12VDC) with smart battery charging support. |  |       |       |
| B.15 | The Respondent must demonstrate what the programming template is supported by and its capabilities. (e.g. the Radio is capable of supporting a single unified programming template of no less than 3,000 combined frequencies/channels/talkgroups.). | Mandatory |       |       |
| B.16 | Radio hardware must be capable of operation on Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), and APCO Common Air Interface (CAI) enabled systems. Radio must be fully compatible with P25 Phase 1 and Phase 2 operation. Identify if Phase 2 is an option or standard feature. | Mandatory |       |       |
| B.17 | Identify if the Radio has options to support 9600 baud P25 data messaging with any pre-defined data messages for a canned response. The Respondent will define their operational parameters and demonstrate how they are used.  |  |       |       |
| 1. **ERGONOMICS**
 |
| C.1 | The Respondent will identify if the Radio’s front face has a multi-color LCD display and define its operational perimeters (e.g. supports no less than four (4) lines and no less than fourteen (14) alphanumeric characters per line in addition to two (2) lines of notification icons. The front display is capable of visually notifying users of incoming calls, potential emergencies, and system events such as low battery, out-of-range). |  |       |       |
| C.2 | Identify if the Radio has options to support a back-lit front face with an alphanumeric keypad compatible and suitable for use with text messaging, channel searching, and soft key/interface operation. |  |       |       |
| C.3 | Identify where the Radio’s Push-To-Talk (PTT) button is located on the Radio.  |  |       |       |
| C.4 | Identify if the Radio and/or handset has an option for programmable buttons. Identify if these buttons are capable of being programmed with the following features at a minimum: squelch, keypad lock/unlock, and scan nuisance/delete. |  |       |       |
| C.5 | Radio must be equipped with a programmable talk-around/repeat-direct switch which must be easily accessible. | Mandatory |       |       |
| C.6 | Identify if the Radio has an internal microphone on both the front and rear panel. The Respondent will demonstrate that both microphones transmit audio with the same clarity and volume regardless of the Radio’s orientation to the user. |  |       |       |
| C.7 | Respondent must identify if the Radio top panel is equipped with, all of the following: | Mandatory |       |       |
|  | 1. Power/volume knob
 |  |       |       |
|  | 1. Channel selector knob
 |  |       |       |
|  | 1. A multifunction programmable switch with no less than three (3) positions
 |  |       |       |
|  | 1. A programmable concentric switch with a minimum of two (2) positions
 |  |       |       |
|  | 1. Multi-color backlit top display panel
 |  |       |       |
| C.8 | Demonstrate if the top panel display can clearly identify emergency activation button by changing the display color.  |  |       |       |
| C.9 | Identify if the Radio emergency activation button is programmable with multifunction support.  |  |       |       |
| C.10 | Demonstrate if the top panel knobs, buttons and switches are individually identifiable by feel. Respondent will identify these traits such as knob size, shape and texture that allow the user to identify a function by its feel. |  |       |       |
| C.11 | Demonstrate how many channels/frequencies are accessible from the top panel channel selector knob. |  |       |       |
| C.12 | Identify if the Radio top-mounted display panel offers: |  |       |       |
|  | a. User-selectable display |  |       |       |
|  | b. Programmable backlight with color selections (i.e*.*, green, red, yellow/amber) |  |       |       |
|  | c. Line of text with alphanumeric characters capable of zone/channel information and visual notifications of incoming calls, potential emergencies, and system events (e.g*.*, battery indicator, P25 signal strength) |  |       |       |
| 1. **TRANSMISSION AND RECEPTION**
 |
| D.1 | The Respondent must identify the number of Radio frequency bands the Radio is capable of operating on and identify the frequency band combination(s). | Mandatory |       |       |
|  | 1. **Single Band**
 |  |       |       |
|  | * 1. VHF 136MHz – 174MHz
 |  |       |       |
|  | * 1. UHF 380MHz – 520MHz
 |  |       |       |
|  | * 1. 700 764-776MHz & 794-806MHz
 |  |       |       |
|  | * 1. 800 806-825MHz & 851-870MHz
 |  |       |       |
|  | 1. **Dual Band**
 |  |       |       |
|  | * 1. VHF 136MHz – 174MHz
 |  |       |       |
|  | * 1. UHF 380MHz – 520MHz
 |  |       |       |
|  | * 1. 700 764-776MHz & 794-806MHz
 |  |       |       |
|  | * 1. 800 806-825MHz & 851-870MHz
 |  |       |       |
|  | 1. **All Bands**
 |  |       |       |
| D.2 | Radio must be capable of operating on narrow (12.5 KHz) channel bandwidth during analog and digital modes, under conventional and trunked operation. | Mandatory |       |       |
| D.3 | Identify if the Radio is capable of operating on VHF and define minimum and maximum wattage (e.g. five (5) Watts maximum and one (1) Watt minimum transmit levels).  |  |       |       |
| D.4 | Identify if the Radio is capable of UHF and define minimum and maximum wattage (e.g. four (4) Watts maximum and one (1) Watt minimum transmit levels).  |  |       |       |
| D.5 | Identify if the Radio is capable of operating on 700/800 and define minimum and maximum wattage (e.g. three (3) Watts maximum and one (1) Watt minimum transmit levels).  |  |      |       |
| D.6 | Identify if the Radio is capable of operating on VHF. If so, identify the reception sensitivity under analog operation in the VHF band of at least 0.25 Uv measured conductively in accordance with TIA/EIA 603 standards under nominal conditions. |  |       |       |
| D.7 | Identify if the Radio is capable of operating on UHF. If so, identify the reception sensitivity under analog operation in the UHF band of at least 0.25 uV measured conductively in accordance with TIA/EIA 603 standards under nominal conditions. |  |       |       |
| D.8 | Identify if the Radio is capable of operating on 700/800. If so, identify the reception sensitivity under analog operation in the 700/800 band of at least 0.25 uV measured conductively in accordance with TIA/EIA 603 standards under nominal conditions. |  |       |       |
| D.9 | Identify if the Radio is capable of operating on VHF. If so, identify the reception sensitivity under digital operation in the VHF band of at least 0.25 uV measured conductively in accordance with TIA/EIA IS 102.CAAA standards under nominal conditions. |  |       |       |
| D.10 | Identify if the Radio is capable of operating on UHF. If so, identify the reception sensitivity under digital operation in the UHF band of at least 0.25 uV measured conductively in accordance with TIA/EIA IS 102.CAAA standards under nominal conditions. |  |       |       |
| D.11 | Identify if the Radio is capable of operating on 700/800. If so, identify the reception sensitivity under digital operation in the 700/800 band of at least 0.25 uV measured conductively in accordance with TIA/EIA IS 102.CAAA standards under nominal conditions. |  |       |       |
| D.12 | Identify if the Radio is capable of operating on VHF. If so, identify if the transceiver is compliant with FCC CFR Title 47 Part 80 for Maritime Services. If so, Respondent must submit certification of compliance with this RFI response. |  |       |       |
| **E. AUDIO SPECIFICATIONS** |
| E.1 | Provide minimum and maximum audio output power in watts.  | Mandatory |       |       |
| E.2 | Identify if Radio is equipped with a Digital Signal Processing (DSP) algorithm designed specifically for background noise reduction. |  |       |       |
| E.3 | Identify if Radio is capable of background noise cancellation. Background noise cancellation profiles must be user selectable. |  |       |       |
| E.4 | Identify if the Radio has an automatic gain control to automatically adjust volume level to compensate for differences in voice level and operating environment. |  |       |       |
| 1. **USER INTERFACE**
 |
| F.1 | Identify if the Radio allows for the creation of multiple user-selectable profiles for the customization of lighting options, programmable buttons, audio levels, tones, and voice annunciations. |  |       |       |
| F.2 | Identify if the Radio alias can be user configurable via the keypad and if this feature allows for the unique identification of multiple users of the same Radio on different shifts. |  |       |       |
| F.3 | Identify if Radio is capable of an emergency activation feature. Identify if the emergency activation feature can be initiated by pressing a programmer-defined emergency button on the Radio. Activation of this feature must cause the Radio to immediately change to a pre‑determined, programmer-defined analog or digital conventional channel or trunked talkgroup. The emergency transmission will use the configuration and parameters of the designated emergency channel or talkgroup, not the channel or mode of operation of the selected frequency/talkgroup prior to emergency trigger activation. The emergency activation feature must be fully functional regardless of current operating mode of the Radio (e.g., digital/analog, direct/repeated). |  |       |       |
| F.4 | Identify if Radio allows custom zone creation by the programming of designated blank zones, permitting user assignment of any accessible channel via the Radio keypad to meet each individual user’s needs. |  |       |       |
| F.5 | Identify if the Radio is capable of customizable voice annunciations to provide audible announcement of, at a minimum, channel selection, direct/repeated mode, scan on/off, keypad lock on/off, and emergency activation. |  |       |       |
| F.6 | Identify if the Radio allows the user to search and select a channel or talkgroup by name with the alphanumeric keypad. |  |       |       |
| F.7 | Identify if the Radio offers a consolidated contact list and, if capable, identify how many contacts it can store with the ability to store at least five (5) different addresses (one (1) conventional unit ID, two (2) different trunking IDs, and two (2) different phone numbers) per contact. Identify and demonstrate that the contact information can be searched and retrieved. |  |       |       |
| 1. **ENCRYPTION**
 |
| G.1 | When optioned, Radio must be capable of supporting both software and hardware based multi‑key encryption for digital communications. | Mandatory, when optioned |       |       |
| G.2 | Identify if the Radio meets or exceed FIPS PUB 140-2 Level 3 standards for tamper-proofing and physical security of the encryption module. If certified, the Respondent must provide certification of compliance from a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory with this RFI response. |  |       |       |
| G.3 | When optioned, Radio must be equipped with AES-256 encryption in accordance with FIPS PUB 197 Advanced Encryption Standard. | Mandatory, when optioned |       |       |
| G.4 | Identify if the Radio supports Over-The-Air Rekeying (OTAR) in accordance with TIA-102 APCO P25 standards for OTAR to allow remote refresh or replacement of encryption keys.  |  |       |       |
| G.5 | Identify if the Radio allows a user-initiated OTAR keyset changeover command (e.g. allowing the user to initiate an OTAR on a Radio which has not yet received updated encryption keys). |  |       |       |
| G.6 | Identify if the Radio is capable of the key-lost-key function to allow the user to request a new key in the event that the Unique Key Encryption Key (UKEK) has been lost. |  |       |       |
| G.7 | Identify if the Radio is capable of being configured for infinite UKEK retention. |  |       |       |
| G.8 | Identify if the Radio is capable of being configured for infinite Traffic Encryption Key (TEK) retention. |  |       |       |
| G.9 | Identify if the Radio supports P25 TIA 102.AACE Link Layer Radio authentication to prevent unauthorized cloned Radios from using the system. |  |       |       |
| G.10 | Identify if the Radio supports encrypted Radio to Radio packet data transmission and reception in accordance with FIPS PUB 197 Advanced Encryption Standard. |  |       |       |
| 1. **SOFTWARE**
 |
| H.1 | Radio must comply with all TIA-102 APCO P25 standards for voice and data transmission on trunking and digital systems. | Mandatory |      |       |
| H.2 | Radio must be compliant with P25 standard failsoft mode on the LA-RICS LMR System in the event of system component failure or degradation, without user intervention. | Mandatory |       |       |
| H.3 | Identify if the Radio supports user aliases and identify if they can be remotely updated.  |  |       |       |
| 1. **PROGRAMMING**
 |
| I.1 | Identify if the programming software and Radio management software is capable of remote Radio management programming software. |  |       |       |
| I.2 | All applicable programming and Radio management software must be provided with an enterprise-wide license, allowing unrestricted and unlimited use by the agency for the full deployment lifecycle of the Radios.  | Mandatory |       |       |
| I.3 | All applicable programming and Radio management software updates, including, but not limited to, programming interface, firmware updates, and any hotfixes must be made available by the Radio manufacturer for direct, unrestricted download to all agency’s programming computers via the internet 24/7 at no additional cost to the Authority and/or agency. All updates must be made available in this way for the full deployment lifecycle of the Radio. | Mandatory |       |       |
| I.4 | Identify if the Radio’s integrated programming and Radio management software can manage Radio templates or profiles in a database that can track each individual configuration file on a per-Radio basis. |  |       |       |
| I.5 | Identify if the Radio’s integrated programming and Radio management software can allow for scheduling of updates, and allow for database reporting features, including system-generated reports on the completion status of individual Radio updates. |  |       |       |
| I.6 | All programming software must be installable and fully functional from any Authority-designated programming computer without requiring access to the internet. | Mandatory |       |       |
| I.7 | Identify if programming software is not restricted in by any Digital Rights Management (DRM) component irrespective of Internet connectivity. |  |       |       |
| I.8 | Programming software must be compatible with Microsoft Windows and support the latest versions to include Windows 10 and 11 (32 bit and 64 bit). Programming software must support future versions of Windows, as they become available, at no additional cost to the Authority and/or agency. | Mandatory |       |       |
| I.9 | Identify if the Radio’s programming software allows the option to program Radios via Wi-Fi or the traditional wired direct connection method. |  |       |       |
| I.10 | Identify if programming software has an interface that can be loaded on a remote computer to allow direct connection to a PC via cable, and full programming functionality over the secure landline network. |  |       |       |
| I.11 | Identify if the Radio can be pre-configured by the Respondent to connect to a specified internal agency’s Wi-Fi network and retrieve all initial programming, firmware, and setup files upon initial power up. |  |       |       |
| I.12 | Identify if the Radio can use Dynamic Host Configuration Protocol (DHCP) for Internet Protocol (IP) connections. |  |       |       |
| I.13 | Identify if the Radio programming software uses a hardware-based security key program for the Radios on LA-RICS LMR System. |  |       |       |
| I.14 | If a programming hardware-based security is required, the Respondent must provide software allowing the Authority and/or agency the ability to generate additional hardware-based security keys as needed at no additional charge. |  |       |       |
| I.15 | Programming software must be capable of managing multiple Radio templates or profiles which store Radio firmware, channel, talkgroup, and other individual Radio configuration information. | Mandatory |       |       |
| I.16 | Identify if the Radio programming software is capable of reading and copying Radio templates or profiles to new templates or profiles via “drag and drop” GUI functionality. |  |       |       |
| I.17 | Identify if programming software allows a template or profile to be shareable across multiple Radios and any changes to the template must be automatically applied to all affected Radios. |  |       |       |
| I.18 | Identify if the Radio programming software is capable of batch programming Radios simultaneously per programming client. Identify if the Radio programming software is capable of updates to Radio firmware, talkgroups, channels, and configuration data. |  |       |       |
| I.19 | Identify if the Radio programming software can allow the flexibility of scheduling batch programming and identify the minimum and maximum Radios per programming client. Identify if the Radio programming software allows scheduled batch programming over wireless batches in succession with no delays or incompatibilities with the LA-RICS LMR System or agency’s private network WiFi. |  |       |       |
| I.20 | All Radios being programming via WiFi and/or all Radios being programmed via wireless systems must not interfere with LA-RICS LMR trunked systems operations. | Mandatory |       |       |
| I.21 | Identify if a Radio being programmed over wireless system can be done with no user intervention and with no key or button manipulation required on the Radio, **OR** requires user intervention (button press acknowledgement) to complete the programming. Identify if both options are available to the Radio programmer and if each is selectable on a case-by-case basis. |  |       |       |
| I.22 | Identify if a Radio being programmed is capable of receiving Respondent firmware updates over the wireless system, and if the firmware file is fully downloaded and assembled, the Radio allows the option of prompting the user to install firmware, **OR** auto-installing firmware updates with no user intervention. Identify if both options are available to the Radio programmer and if each is selectable on a case-by-case basis. |  |       |       |
| I.23 | Identify if the Radio has programmable buttons on the Radio and if they are capable of being programmed remotely via wireless system. |  |       |       |
| I.24 | Identify if the Radio has programmable management software that is capable of communicating with the Radios over USB, Wi-Fi, and the wireless system using Radio’s serial numbers. |  |       |       |
| I.25 | Identify if the Radio programming and management software database allows multiple programming clients to access the database simultaneously. |  |       |       |
| I.26 | Respondent must provide a licensed and fully functional sample copy of all Radio programming and Radio management software for the purposes of testing the software compatibility with the existing LA‑RICS software and LMR System and validation of functionality in accordance with these specifications. | Mandatory |       |       |
| 1. **TEXT MESSAGING SERVICE**
 |
| J.1 | Identify if the Radio can send and receive free-form alphanumeric individual and group text messages via the alphanumeric keypad. |  |       |       |
| J.2 | Identify if the Radio can send and receive predetermined (canned) text messages (e.g., “reroute”, “arrived”, “acknowledged”). |  |       |       |
| J.3 | Identify if the Radio can send group messages simultaneously rather than serially (one at a time). |  |       |       |
| J.4 | Identify if the Radio is capable of automatically receiving system-generated group messages. |  |       |       |
| J.5 | Identify if the Radio can allow all message metadata and content. |  |       |       |
| J.6 | Identify if the Radio can provide an audible alert and notification icon to notify the user of a received text message or call alert page. Identify if this feature is programmer configurable and user-selectable. |  |       |       |
| 1. **GPS SPECIFICATIONS**
 |
| K.1 | Identify if the Radio can transmit and receive GPS coordinates over the LA‑RICS LMR trunked system for mapping. If so, identify if the GPS features are in full compliance with the following industry standards: |  |      |       |
|  | 1. TIA-102.BAJA-A
 |  |       |       |
|  | 1. TIA-102.BAJB-A
 |  |       |       |
|  | 1. TIA-102.BAJC-A
 |  |       |       |
|  | 1. TIA-102.BAEA-C
 |  |       |       |
|  | 1. TIA-102.BAJD
 |  |       |       |
|  | 1. WGS 84
 |  |       |       |
| K.2 | Identify if the Radio is capable of allowing the transmission of GPS location services data on any or all of the following event triggers: |  |       |       |
|  | 1. At a predetermined time interval
 |  |       |       |
|  | 1. On each PTT activation
 |  |       |       |
| K.2(cont’d) | 1. On each PTT activation after a set time interval without GPS data
 |  |       |       |
|  | 1. On emergency activation
 |  |       |       |
|  | 1. On “Man-down” status
 |  |       |       |
|  | 1. Periodically (short time interval)
 |  |       |       |
|  | 1. When distance travelled exceeds a threshold since last check-in
 |  |       |       |
|  | 1. In response to a query from the data host system (i.e., dispatcher terminal)
 |  |       |       |
|  | 1. When crossing a host configurable boundary line
 |  |       |       |
|  | 1. When entering a host configurable geo-fence area
 |  |       |       |
| K.3 | Identify if the Radio is capable of supporting dynamic GPS polling, which must allow the Radio to provide current GPS location data to the dispatcher upon their request.  |  |       |       |
| K.4 | Identify if the Radio is capable of supporting GPS packet data over both digital conventional and trunked P25 systems.  |  |       |       |
| K.5 | Identify if the Radio is compatible with P25 GPS standards.  |  |       |       |
| K.6 | Identify if the Radio can support geo-fencing for automatic talkgroup assignment and/or system steering. Identify if geo-fencing can be configurable by the dispatcher to allow the alteration of geo-fencing assignments to deployed Radios remotely. |  |       |       |
| K.7 | Identify if geo-fencing functionality is offered by programmable notifications, display color changes, and voice announcement triggers. |  |       |       |
| 1. **ANALOG SIGNALING FORMAT**
 |
| L.1 | Identify if Radio is fully capable of operating with the MDC-1200 analog signaling format. Identify if Radio is capable of encoding and decoding MDC-1200 signaling, including emergency signaling. |  |       |       |
| L.2 | Identify if Radio is capable of muting the received MDC-1200 signaling burst to prevent the tone being audible to the user. |  |       |       |
| L.3 | Identify if the Radio is capable of supporting MDC-1200 enhanced ID range. (e.g. Radio must support a five-digit decimal unit ID up to and including 65,534). |  |       |       |
| L.4 | Identify if the programming software is capable of allowing MDC ID to be entered in either decimal or hexadecimal format. |  |       |       |
| L.5 | Identify if the Radio programming software can support multiple (no fewer than five [5]) independent MDC-1200 configurations/profiles. Identify if each individual MDC-1200 configuration/profile offers the following options at a minimum: |  |       |       |
|  | 1. MDC burst at key up or de-key
 |  |       |       |
|  | 1. Configurable delay at MDC burst send
 |  |       |       |
|  | 1. PTT ID sidetone on/off
 |  |       |       |
|  | 1. PTT ID sidetone short/long
 |  |       |       |
|  | 1. MDC system and acknowledge pretime
 |  |       |       |
|  | 1. Repeater access pretime
 |  |       |       |
|  | 1. Radio inhibit
 |  |       |       |
|  | 1. Radio check
 |  |       |       |
|  | 1. Canned message via MDC
 |  |       |       |
| L.5(cont’d) | 1. User ability to create an alias for MDC ID (e.g. the user can enable/disable the ID via programming software or front panel)
 |  |       |       |
| 1. **BATTERIES**
 |
| M.1 | Each Radio must be provided with two (2) Original Equipment Manufacturer (OEM) produced lithium-ion or lithium-polymer chemistry batteries. The included batteries must be rated at a minimum capacity and include batteries for an OEM high capacity.  | Mandatory |       |       |
| M.2 | Identify if the battery assembly meets MIL-STD-810F standards for operation in extreme and rugged environments. |  |       |       |
| M.3 | Respondent must provide certification with this RFI response of the batteries operating temperature range (e.g., -30°C to +50°C). | Mandatory |       |       |
| M.4 | Respondent must provide certification with this RFI response of the battery’s relative humidity properties (e.g., operates at 90% at +50°C for a minimum of eight (8) hours). | Mandatory |       |       |
| M.5 | Identify if the battery has an electrical short prevention mechanism for all charging contacts that remain visible while the battery is attached to the Radio. |  |       |       |
| M.6 | Identify if the battery includes the following:  |  |       |       |
|  | 1. A one (1) year manufacturer’s warranty from delivery date.
 |  |       |       |
|  | 1. If the warranty covers all manufacturer’s defects and/or deficiencies of construction, including premature cell degradation, in accordance with these specifications.
 |  |       |       |
| M.6(cont’d) | 1. If the battery maintains a charge of 85% or more of nominal capacity for the first year of use, and if not is it subject to warranty replacement.
 |  |       |       |
|  | 1. If all warranty repairs and replacements, and all associated shipping costs are borne by the Respondent.
 |  |       |       |
| M.7 | Identify if the battery has an internal electronic circuitry to enable intelligent battery management. |  |       |       |
| M.8 | Identify if the battery management has the following features: |  |       |       |
|  | 1. Capacity monitoring
 |  |       |       |
|  | 1. Automatic reconditioning
 |  |       |       |
|  | 1. Charging, discharging, and reconditioning history of the battery
 |  |       |       |
|  | 1. Over-the-air battery monitoring to provide all above information
 |  |       |       |
| M.9 | Identify if the battery management that can utilize a single platform for intelligent battery management.  |  |       |       |
| M.10 | Identify if the battery management is Intelligent capable of communicating with an OEM manufactured smart charger which is capable of reconditioning the battery as needed to maximize battery life. |  |       |       |
| 1. **REQUIRED ACCESSORIES**
 |
| N.1 | Each Radio must include a compatible OEM manufactured single slot battery charger with the following features: | Mandatory |       |       |
|  | 1. Identify if Charger is compatible with other after-market batteries
 |  |       |       |
| N.1(cont’d) | 1. Identify if Charger is compatible with standard 120V AC power
 |  |       |       |
|  | 1. Identify if Charger includes all required cords, cables, and power supplies
 |  |       |       |
|  | 1. Identify if Charger has an access port for computerized remote battery management
 |  |       |       |
|  | 1. Identify if Charger allows user-selectable charging for quick, standard, or reconditioning charging modes
 |  |       |       |
|  | 1. Identify if Charger allows user-cancellation of reconditioning charge mode once started
 |  |       |       |
|  | 1. Identify if Charger provides status indicators for the following: power on, charging, reconditioning, battery temperature, charger malfunction, and bad battery
 |  |       |       |
|  | 1. Identify if Charger is capable of charging the battery while it is still attached to the Radio.
 |  |       |      |
|  | 1. Identify if Charger is capable of charging the battery while it is detached from the Radio.
 |  |       |       |
| N.2 | Each Radio must include a compatible OEM manufactured Remote Speaker/Microphone (RSM) with the following features: | Mandatory |       |       |
|  | 1. Identify if RSM is corded (not cordless) and if the cord is straight or coiled, or if both are available.
 |  |       |       |
|  | 1. Identify if RSM connector is compatible with the Radio without requiring any additional adapters
 |  |       |       |
|  | 1. Identify if RSM has a locking feature to prevent removal without a tool
 |  |       |       |
|  | 1. Identify if RSM is highly impact resistant
 |  |       |       |
| N.2(cont’d) | 1. Identify if RSM PTT button is made of a resistant material (e.g. a ruggedized, polymer-like substance, and not be degraded by UV radiation or environmental factors under normal operation)
 |  |       |       |
|  | 1. Identify if RSM PTT button is easily accessible and located on the left side panel when looking at the face of the RSM
 |  |       |       |
|  | 1. Identify if RSM includes a replaceable rotating clip that allows attachment to a uniform epaulet
 |  |       |       |
|  | 1. Identify if RSM includes a non-threaded 3.5mm earphone jack with attached cover
 |  |       |       |
| N.3 | Each Radio must include a compatible OEM manufactured antenna for the appropriate banded Radio (e.g. single or multi-band antenna) with the following features: | Mandatory |       |       |
|  | 1. Antenna must support all frequencies and Radio ranges listed within this RFI
 |  |       |       |
|  | 1. Antenna must be engineered for maximum performance on single or multi-band Radios in the VHF/UHF/700/800MHz & GPS Radio spectrums
 |  |       |       |
|  | 1. Antenna connector must be compatible with the Radio without any additional adapters
 |  |       |       |
|  | 1. Antenna sheathing must be ruggedized material
 |  |       |       |
|  | 1. Antenna must not be rigid and must be the most flexible variety compatible for use in accordance with the above requirements
 |  |       |       |
| N.4 | Identify if each Radio includes a compatible OEM manufactured holster for carrying the Radio attached to a duty belt. Identify if the belt holster includes the following features: |  |       |       |
| N.4(cont’d) | 1. Identify if holster is constructed of leather or of a ruggedized, polymer-like substance
 |  |       |       |
|  | 1. Identify if holster holds the Radio in place by friction fit without requiring a holding strap
 |  |       |       |
|  | 1. Identify if holster is attachable to a belt by means of an included detachable belt clip
 |  |       |       |
|  | 1. Identify if Radio side panel controls is easily accessible while in the holster
 |  |       |       |
|  | 1. Identify if holster allows the Radio to be easily attached or removed without causing the RSM to loosen or detach from the Radio
 |  |       |       |
| 1. **WARRANTY**
 |
| O.1 | Identify if Radio includes a Warranty as follows: |  |       |       |
|  | 1. One (1) year manufacturer’s warranty.
 |  |       |       |
|  | 1. Identify if Warranty covers all manufacturer’s defects and/or deficiencies of construction.
 |  |       |       |
|  | 1. Identify if all warranty repairs and replacements, and all associated shipping costs are borne by Respondent.
 |  |       |       |
| O.2 | Identify if Respondent provides as-needed direct telephone access to manufacturer’s factory technical staff, without requiring intermediary (call center) technical support escalation, to address any emergency Radio issues or software bugs that may impact first responder safety. Identify if this support is provided, at a minimum, without restriction during manufacturer’s normal business hours, with no additional costs. |  |       |       |